PC PREAMP

USER'S MANUAL

ROCKTRON
CORPORATION

May be covered by one or more of the following: U.S. Patents #4538297, 4647876, 4696044, 4745309, 4881047, 4893099, 5124657, 5263091, 5268527, 5319713, 5333201, 5402498 and 5493617. Other patents pending. Foreign patents pending.

CE

Your Rocktron PC Preamp has been tested and complies with the following Standards and Directives as set forth by the European Union:

Council Directive(s): 89/336/EEC, 73/23/EEC

Standard(s): EN55013, EN50082-1

This means that this product has been designed to meet stringent guidelines on how much RF energy it can emit, and that it should be immune from other sources of interference when properly used. Improper use of this equipment could result in increased RF emissions, which may or may not interfere with other electronic products.

To insure against this possibility, always use good shielded cables for all audio input connections. This will help insure compliance with the Directive(s).

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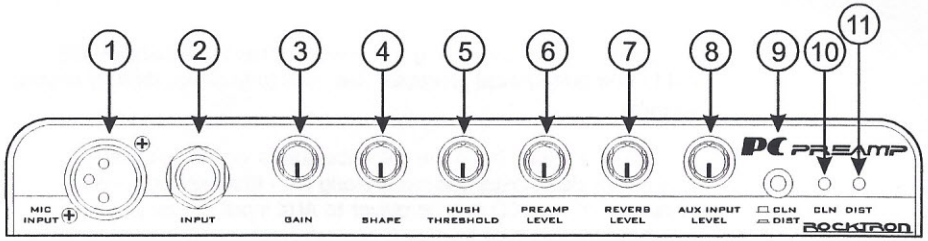
Introduction

Thank you for purchasing the new Rocktron PC Preamp — the world's first guitar/vocal processor designed to interface directly to your computer.

The PC Preamp turns the computer into a virtual guitar amp system with clean/distortion tones along with REAL spring reverb. Connection of your CD or tape player to AUX input makes playing or singing along with your favorite tunes extremely easy. Record them right to the PC using any wave recording software.

The PC Preamp is designed to take up as little workspace as possible — place it under the monitor or mount it to the side of your tower.

Front Panel



1 **MICrophone INPUT XLR connector**

This input is used for low impedance microphones, and is connected to the ¼" input. When the ¼" input is used, the XLR input is disabled.

Set the mode select switch (9) to the CLN position when using the XLR input.

2 **¼" phone INPUT jack**

This ¼" standard phone jack provides an input to the PC Preamp.

3 **GAIN control**

This control determines the amount of gain applied to the signal in the distortion mode.

4 **SHAPE control**

This control determines the amount of midrange scoop applied overall in both clean and distortion modes.

5 **HUSH THRESHOLD control**

In the distortion mode, this control determines the minimum input level at which the HUSH filter and downward expander will begin to operate. This operation is present in the distortion mode only.

In the clean mode, the internal SSM2000 HUSH circuit is configured to operate as a compressor. Note that the HUSH THRESHOLD control is disabled when operating the PC Preamp in clean mode.

6 **PREAMP LEVEL control**

This control determines the overall level of the preamp section only.

7 **REVERB LEVEL control**

This control determines the overall amount of reverb applied to the signal.

8 **AUX INPUT LEVEL control**

This control determines the overall level of the signals applied to the RCA AUX INputs on the rear panel of the PC Preamp.

9 **CLN/DIST switch**

This switch is used to select CLEAN or DISTORTION mode.

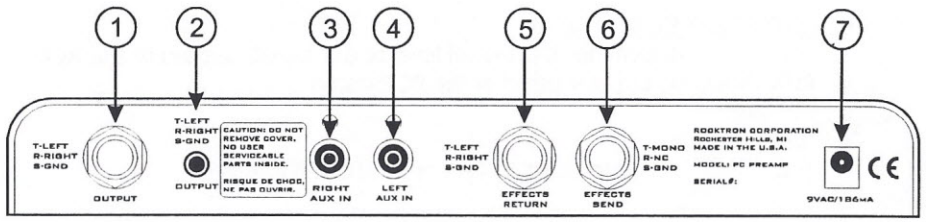
10 **CLN LED**

When lit, indicates that the CLEAN channel is currently active. In the clean mode, the internal SSM2000 HUSH IC is configured to provide compression.

11 **DIST LED**

When lit, indicates that the DISTORTION channel is currently active. In the distortion mode, the SSM2000 HUSH IC is configured to provide HUSH noise reduction.

Rear Panel



1 **$\frac{1}{4}$" OUTPUT jack**

This $\frac{1}{4}$" phone jack provides the main output of the PC Preamp. All processed signals, including those applied to the AUX inputs, will be fed to this output.

This jack is configured for RTS operation, where T=left, R=right, and S=GND.

2 **$\frac{1}{8}$" OUTPUT jack**

This $\frac{1}{8}$" phone jack provides the main output of the PC Preamp to be connected to the $\frac{1}{8}$" mic input of the sound card on the computer.

This jack is also configured for RTS operation, where T=left, R=right, and S=GND.

3 **RIGHT AUXiliary INput RCA jack**

This RCA input provides external signal to the ring of the $\frac{1}{4}$" and $\frac{1}{8}$" OUTPUT jacks (#1 and #2 above). The AUX INPUT LEVEL on the front panel determines the overall level of the signal applied at this jack.

4 **LEFT AUXiliary INput RCA jack**

This RCA input provides external signal to the tip of the $\frac{1}{4}$" and $\frac{1}{8}$" OUTPUT jacks (#1 and #2 above). The AUX INPUT LEVEL on the front panel determines the overall level of the signal applied at this jack.

5 **EFFECTS RETURN jack**

This standard $\frac{1}{4}$" RTS jack provides a stereo return for effects. Any signal applied to this jack is inserted just prior to the reverb section in the signal path (as shown in the block diagram on page 11). T=left, R=right, and S=GND.

6 **EFFECTS SEND jack**

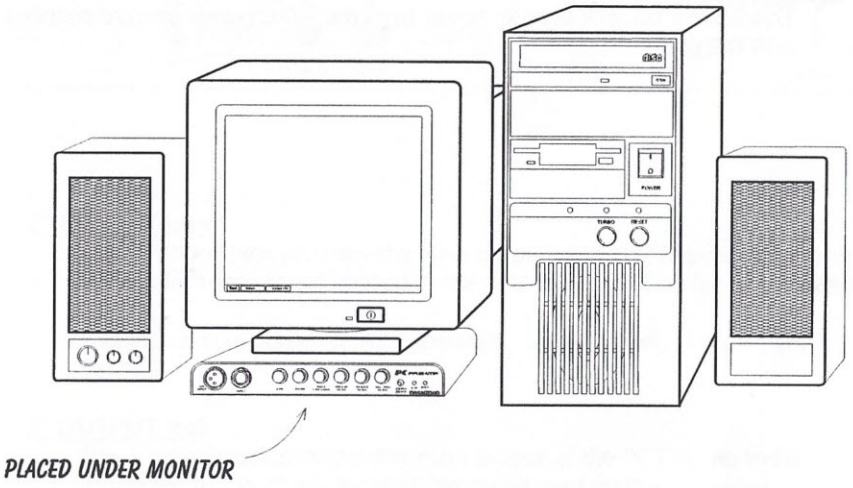
This standard $\frac{1}{4}$" jack provides a mono send from the PC Preamp to external effects. The EFFECTS SEND jack provides signal from the preamp section only — not the AUX inputs. T=mono, S=GND.

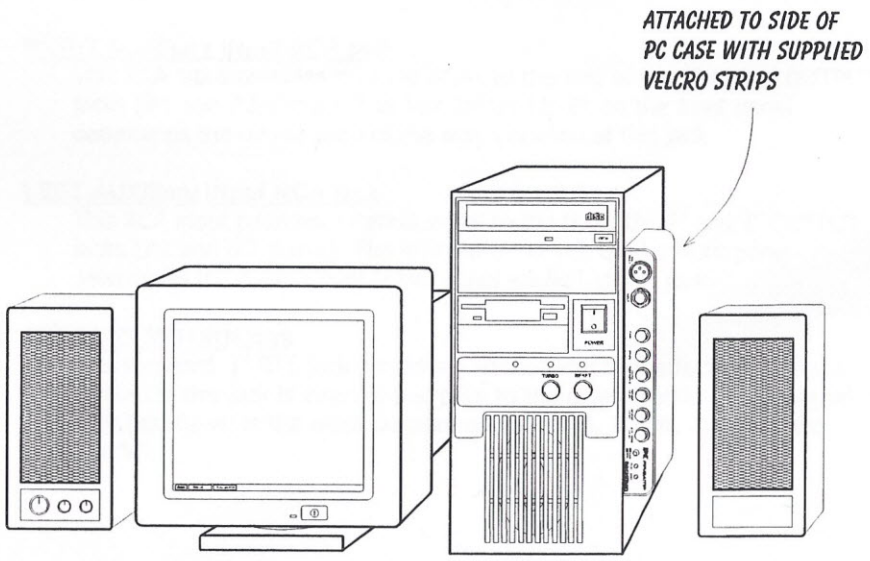
7 **POWER jack**

This 2.5mm pin jack accepts power from the 9VAC power adapter supplied with the unit.

Placement

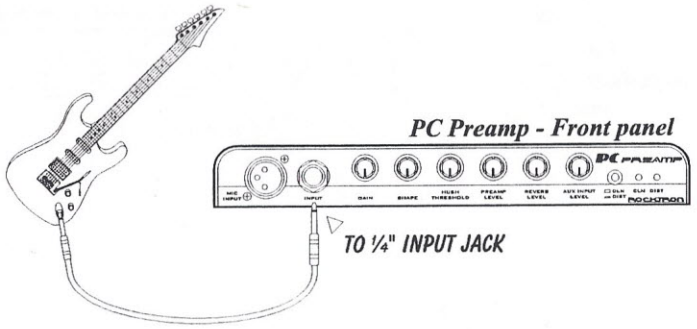
The PC Preamp can be placed in any convenient location. However, note that some monitors can introduce additional noise if the preamp is located too close. If a noisy condition should occur, re-adjust the position of the PC Preamp until the best results are achieved.

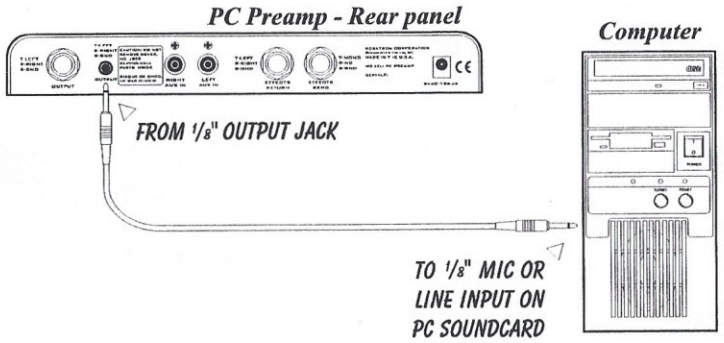




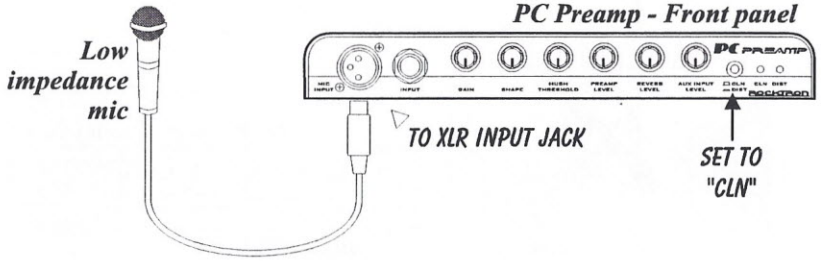
Connections

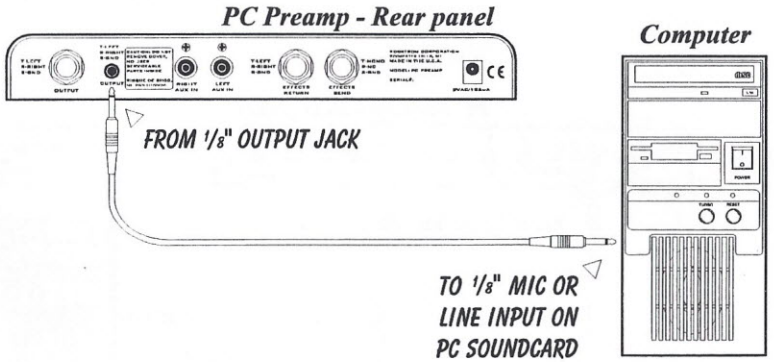
Guitar applications



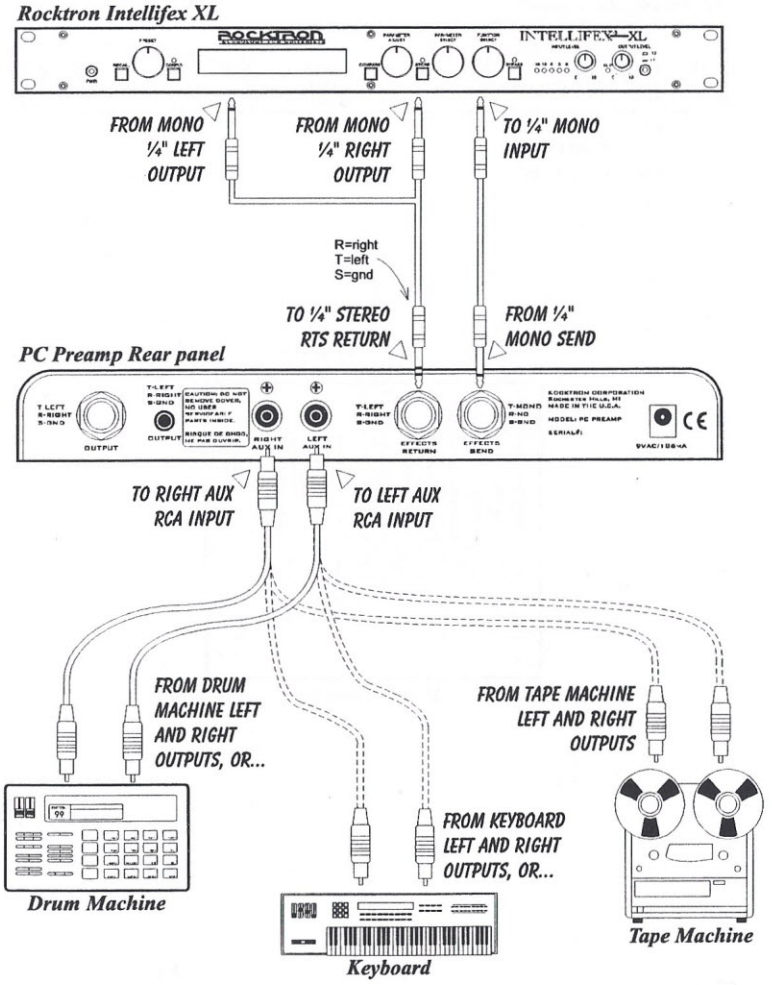


Microphone applications



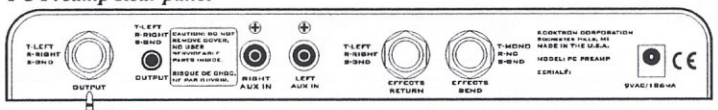


Outboard effects and auxiliary input signals



Mixing applications

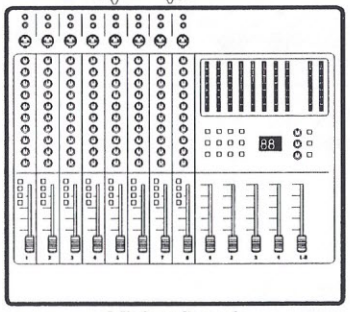
PC Preamp Rear panel



FROM ¼" RTS OUTPUT

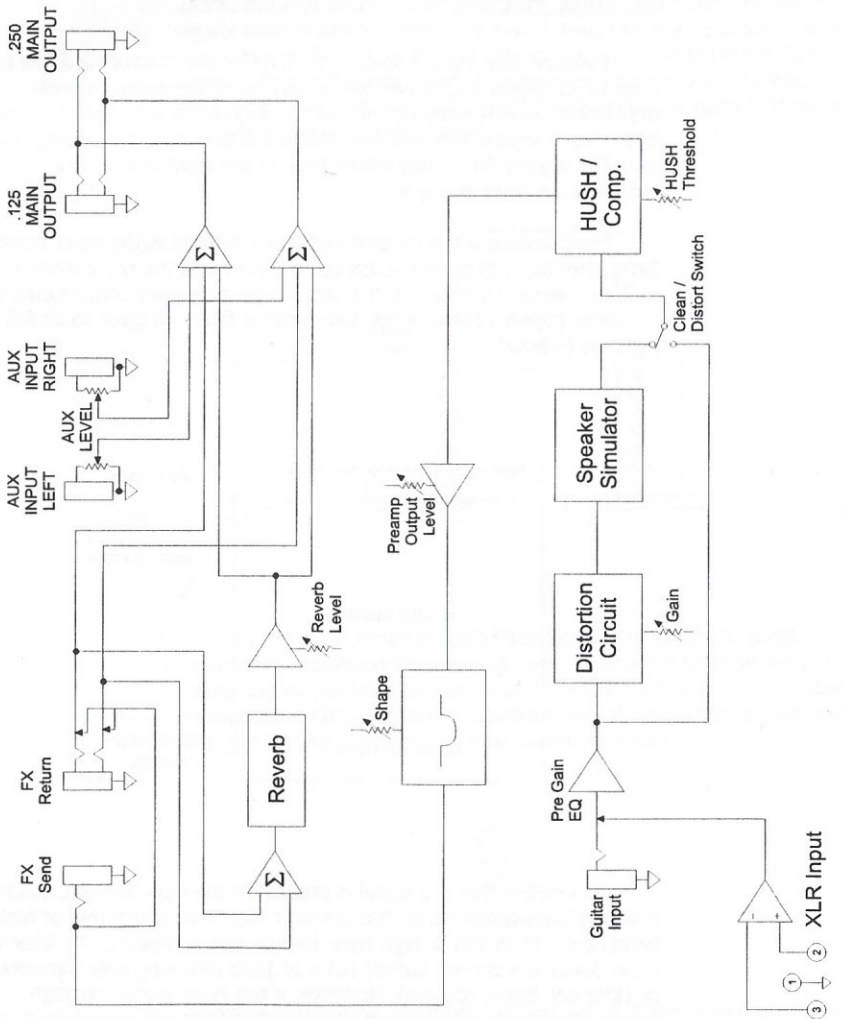
TO LEFT ¼" INPUT

TO RIGHT ¼" INPUT



Mixing Console

Block Diagram



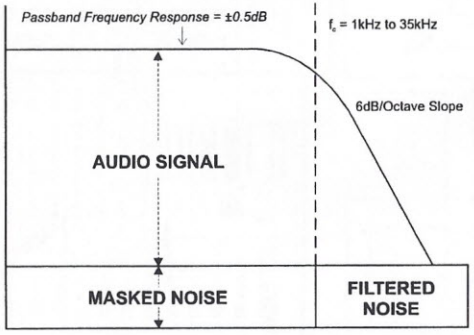
Operation

About HUSH noise Reduction

Dynamic Filtering

Dynamic filtering is achieved by dynamically-controlling a low pass filter which opens and closes the bandwidth of the output signal dependent upon the amount of mid and high band information present in the input signal. The filter bandwidth will only open far enough to pass the highest frequency information in the input signal, thus reducing the noise above it.

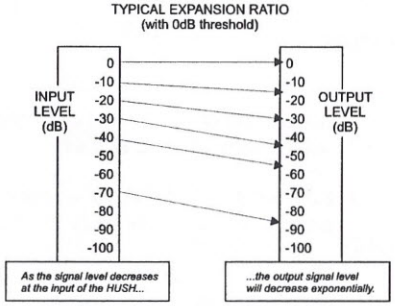
For example, if the highest frequency present in the input signal is 8kHz, the filter will open to pass up to 8kHz while the noise from 8kHz to 20kHz would be reduced. If a signal with frequency components up to 20kHz appears at the input, the dynamic filter will open to its full extreme (40kHz).



This means that if a signal is present at the input which consists of primarily bass components, the dynamic filter will reduce mid or high band noise. If no mid or high band information is present, the filter will close down to a pre-set cut-off point of 1kHz (allowing only frequencies of 1kHz and below to pass). However, if the input signal has high frequency components present, the dynamic filter will open fully to pass the signal and eliminate the possibility of a loss of high end frequency response.

Downward Expansion

The second half of the HUSH® process incorporates downward expansion. The low level expander of the HUSH system operates like an electronic volume control. The HUSH system utilizes a voltage-controlled amplifier (VCA) circuit which can control the gain between the input and the output from unity to 30, 40 or even 50dB of gain reduction. When the input signal is above the user preset threshold point, the VCA circuit remains at unity gain. (This means that the output signal level is equal to the input signal level.) As the input signal level drops below the user preset threshold point, downward expansion begins. It is at this point that the expander acts like an electronic volume control and gradually begins to decrease the output signal level relative to the input signal level.



As the input signal drops further below the threshold point, downward expansion increases. A drop in the input level by 20dB would cause the output level to drop approximately 40dB (i.e., 20dB of gain reduction). In the absence of any input signal, the expander will reduce the gain so that the noise floor becomes inaudible.

HUSH
THRESHOLD

The front panel *HUSH Threshold* control determines the minimum input level at which the HUSH filter and downward expander will begin to operate. Setting this control too high will result in a loss of sustain, as notes will tend to die out much faster than they should. Conversely, when set too low, the expander will close too late (if at all) and the noise floor will remain audible.

About the Analog Devices SSM2000...

The SSM2000 is an advanced audio noise reduction system based on patented HUSH® technology. The SSM2000 is commercially available from Analog Devices, produced under the license of the HUSH patents. HUSH® combines a dynamic filter and downward expander to provide a high level effectiveness without the sonic artifacts normally associated with noise reduction systems. In addition, an Adaptive Threshold circuit detects nominal signal levels and dynamically adjusts both thresholds, thereby providing optimal results regardless of program source. Since it is a single-ended system, HUSH can be used on virtually any audio source, including audio and video tapes, radio and television broadcasts, or any other source with objectionable noise. The SSM2000 can also be used with Dolby® encoded sources with excellent results.

FEATURES:

- Up to 25dB of noise reduction from virtually any audio source without sonic artifacts
- External port available for additional attenuation—providing in excess of 85dB of noise reduction
- "Single-ended" operation eliminates need for encode-decode process
- Adaptive threshold dynamically adjusts to changing nominal signal levels
- Effectively decodes Dolby® encoded sources
- Direct VCA control port access for additional level control functionality
- Logic-controllable bypass and muting
- Flexible on-chip voltage reference
- 100dB dynamic range (noise reduction OFF)
- 0.02% typical THD+N (@ 1kHz, noise reduction OFF)
- +7V to +20V operation
- No royalty requirements

Specifications

Maximum Input	*+10dB*
Maximum Output	*+2dB*
Input Impedance	*¼": 470KΩ, XLR: 11KΩ, Aux In: 25KΩ*
Output Impedance	*1KΩ*
Shape Control	*20dB @ 1kHz*
Gain Control	*80dB of gain*
Current Consumption	*186mA*
Power Requirements	*9VAC/1.5A adapter*
Compression	*Attack: 15mS, Release: 50mS*
Noise Reduction	*20dB*
Reverb	*Accutronics*